



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

January 31, 2014

Group Chairman's Factual Report

Addendum 1

OPERATIONAL FACTORS

DCA13MA120

A. ACCIDENT

Operator: Asiana Airlines
Location: San Francisco, California
Date: July 6, 2013
Time: 1127 Pacific Daylight time (PDT)¹
Airplane: Boeing B777-200 ER, HL7742

B. OPERATIONAL FACTORS GROUP

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C. SUMMARY

On July 6, 2013 at 11:28 pacific daylight time, a Boeing 777, registration HL7742, operated by Asiana Airlines as flight 214, struck the seawall short of runway 28L at San Francisco International Airport. The airplane was destroyed by impact forces and fire. Three of the 291

¹ All times in the report will be in Pacific Daylight Time

passengers were fatally injured. The flight was a regularly scheduled passenger flight from Incheon International Airport, Seoul, Korea, and was operated under the provisions of 14 Code of Federal Regulations Part 129. Visual meteorological conditions prevailed at the time of the accident.

D. DETAILS OF THE INVESTIGATION

Following the public investigative hearing on December 11, 2013, the operations group chairman identified additional factual information of interest to the investigation. That information is provided here.

E. FACTUAL INFORMATION

The following information is added.

1.0 Added section 4.2.5 – Flight with Unreliable Airspeed

The Boeing FCOM, chapter PI, “Performance Inflight,” pages PI.10.30-31, showed values for the B777-200ER for approximate pitch attitude and power setting for various phases of flight. For flight on final approach (1,500 feet), gear down, thrust set to maintain a 3° glideslope, 30° flaps and speed Vref for that flap setting plus 10 kts (approximate approach speed), the chart showed for a landing weight of 450,000 lbs. the corresponding expected pitch attitude was 0° and the expected power setting was 1.060 EPR and 57.9% N1RPM. For a landing weight of 350,000 lbs, the chart showed an expected pitch attitude of -0.5° and expected power setting of 1.040 EPR and 51.2% N1RPM.²

2.0 Added section 5.2.5 – Approach Briefing

The Asiana FOM, chapter 7, “Normal Operations,” section 7.7.1.4, “Approach Briefing,” stated approach briefing items included:

- Weather and NOTAM’s
- Approach chart review
- Crew action and callout
- Non-Normal configuration and conditions
- Landing and taxi-in procedure
- Other information
- Special Briefing

One reason given for performing a special briefing was if “temporarily unstable approach condition or non-normal (abnormal) procedure is needed.”³

3.0 Added section 5.2.6 – Maximum Descent Rate

² See attachment 1

³ See attachment 2

The Asiana FOM, chapter 7, “Normal Operations,” section 7.8.9, “Maximum Descent Rate,” stated the maximum descent rate to avoid CFIT (controlled flight into terrain) was 1,500 fpm for altitudes between 2,000 ft. AGL and 1,000 ft. AGL, and 1,000 fpm for flight below 1,000 ft. AGL.⁴

4.0 Added section 5.2.7 – Decision to Land – Responsibility

The Asiana FOM, chapter 7, “Normal Operations,” section 7.10.2.1, “Responsibility,” stated:

“Captain has the authority and responsibility to make a landing or missed approach (go-around) considering actual weather condition and stabilized approach condition.”⁵

5.0 Added section 5.3.9 – Landing Flaps and Landing Checklist

The Asiana POM, chapter 13, “Approach Procedures,” section 2.13.11.2, “Landing Flaps (Flaps 25/30) provided a table indicating when to set landing flaps. It stated the timing of the flap configuration could be changed to adjust to the requirements of the airport or ATC. In the same chapter of the POM, section 2.13.13, “Conducting Landing Checklist,” it stated the PM conducted the landing checklist on the order of the PF, and in the event of two or more runways in use (including parallel runways), the PM should verify the landing runway in order to prevent any confusion.⁶

6.0 Added section 5.3.10 – Visual Approach

The Asiana POM, chapter 2, “Visual Approach,” section 2.18, provided company guidance to pilots for the conduct of visual approaches. The section described how to set up a downwind, base and final leg using the FMC arrival page, and how to use distance from the runway end and timing techniques to fly the visual traffic pattern. Section 2.18.1.4, “Final Approach,” recommended an approach path of approximately 2 ½ to 3 degrees, using a profile guideline of 300 feet above the airport elevation for each mile from the runway, and maintaining a stabilized rate of descent of 700 to 900 fpm. The section stated the PM should call out “five hundred” at 500 feet height above touchdown (HAT) and the PF should respond “landing” or “stabilized.” It stated a go around should be made if the approach was not stabilized.⁷

7.0 Added section 5.3.11 – Captain’s Responsibility in an Emergency

The Asiana POM, chapter 4, “Non-normal Procedures,” section 4.1.4, “Authority and Responsibility in Emergency,” section 4.1.4.1, “Captain,” stated:

“In an emergency situation that requires immediate action for the safety of the passengers, crew and aircraft, the captain may deviate from prescribed operation

⁴ See attachment 3

⁵ See attachment 4

⁶ See attachment 5

⁷ See attachment 6

*procedures and aviation regulations. At this time the captain shall notify appropriate ATC facilities immediately (of) the deviated situation.”*⁸

8.0 Added section 5.5 – Asiana Instructor Training

The Asiana Flight Crew Training Regulation (FCTR) provided specific guidance on the conduct of pilot training at Asiana. Chapter 5 of the FCTR addressed instructor training and checks. Section 5.3.3, “Flight Instructor,” stated that flight instructors were required to have 500 or more flight hours as PIC in the aircraft type involved, have a type rating for the aircraft, be competent and proficient in aircraft operation, and demonstrate proficiency in ground school and flight training. Section 5.5.3, “Appointment Training for Flight Instructors and Evaluation,” provided an outline of the subject matter and curriculum for flight instructor training.⁹

The Asiana Training Guide for B777 Flight Instructor Training, Course code OT-IF-777, dated September 13, 2010, provided specific detailed guidance for the training of new flight instructors. The Training Guide is shown in attachment 9.

9.0 Added section 5.6 – Asiana B777 Transition Simulator Training Guide

The Asiana Training Guide for B777 transition simulator training, Course code OT-CO-777, revision 10, dated January 24, 2012 provided specific detailed guidance for the simulator training of pilots transitioning to the B777. The FFS (full flight simulator) portion of the training guide is shown in attachment 10.

10.0 Added section 5.7 – Asiana B777 Recurrent Simulator Training Guide

The Asiana Training Guide for B777 recurrent simulator training from 2010 to 2013¹⁰ is shown in attachment 11. The revision dates for each annual training plan is shown at the bottom of the respective page.

11.0 Added section 5.4.5 – Use of Flight Director on Visual and Circling Approaches

The FCTM, page 5.60-61, “Visual Approach - General,” dated June 30, 2013, addressed procedures for flying a visual approach. No reference is made in this section to the use of flight directors. The FCTM, page 5.54, “Circling Approach – General,” dated June 30, 2013, does address the use of flight directors during a circling approach. It stated:

“When intercepting the visual profile, disengage the autopilot and continue the approach manually. At this point in the approach, the pilot's attention should be focused on flying the visual profile rather than attempting to set the MCP or FMC to allow continued use of the autopilot. After intercepting the visual profile, cycle both F/D to OFF, and select the PM F/D to ON. This eliminates unwanted commands for the PF and allows continued

⁸ See attachment 7

⁹ See attachment 8

¹⁰ The pages shown as “2nd half of 2013,” dated August 8, 2013, are post-accident curricula.

F/D guidance for the PM in the event of a go-around when pitch or roll mode is changed. Complete the landing.

***Note:** If a go-around is selected with either flight director switch in the OFF position, the flight director pitch or roll command bar on the corresponding side will disappear when the first pitch or roll mode is selected or engaged”¹¹*

F. LIST OF ATTACHMENTS

Attachment 1:	B777 FCOM - Flight with Unreliable Airspeed Chart (Official Use Only)
Attachment 2:	FOM – Approach Briefing
Attachment 3:	FOM – Maximum Descent Rates
Attachment 4:	FOM – Responsibility for Decision to Land
Attachment 5:	POM – Landing Flaps and Landing Checklist
Attachment 6:	POM – Visual Approach
Attachment 7:	POM – Responsibility in Emergency
Attachment 8:	FCTR – Flight Instructor Requirements and Training Curriculum
Attachment 9:	Asiana Training Guide For B777 Flight Instructor Training
Attachment 10:	Asiana Training Guide For B777 Transition Simulator Training
Attachment 11:	Asiana Recurrent Simulator Training 2010 to 2013
Attachment 12:	FCTM Use of Flight Director on Visual and Circling Approaches (Official Use Only)

¹¹ See attachment 12